

possibility of infarction. In their clinic the diagnosis of pulmonary infarction has been anything but good. They have recognized only 10 per cent of their cases, which they believe is due to the fact that the diagnosis has been based practically always upon the physical findings in the thorax instead of the whole clinical picture. The typical case of pulmonary infarction occurs in a postoperative patient who is convalescing from a laparotomy, frequently a hysterectomy. This complication occurs practically always in the second or third week after operation. The temperature curve is quite characteristic when not complicated by other factors. The patient has a low unexplained evening temperature of 99° to 100° F. after operation. After the day of the infarction the temperature rises sharply, but seldom goes much above 102° F. The curve is hectic in type, not like that of pneumonia. It reaches its highest point between the second and fourth days and usually drops almost to normal again at the end of a week. Infarction almost always makes its appearance in an acute attack with sharp sticking pain over the ribs as the dominant symptom. The attack may rarely be accompanied by a definite chill, although chilly sensations are rather frequent. The leukocyte count varies between 12,000 and 18,000 and is of little help in the diagnosis. The physical signs rarely make their appearance before the second day and the most constant of these is the friction rub, which was noted in 75 per cent. of their cases. They believe that it is probably present in a greater number, but this represents only those cases in which it was noted upon the history. Rales were heard in 75 per cent. of the cases; they are usually evident a little later than the friction rub. Impairment and changes in the breath sounds appear last and were noted in 63 per cent. of the cases. Pain ushers in the attack and is always the predominant symptom. Cough, while present in 63 per cent. of the cases at some time, is usually not severe, and in most cases is unproductive. Hemoptysis was present in 36 per cent. of the cases and when present, practically clinches the diagnosis. Phlebitis, pain and swelling of the leg occurred in 41 per cent. of this series, and when present is just as confirmatory as hemoptysis. In the typical case, the patient is out of bed, convalescing in a normal way when she is seized with a sharp pain in her side, more especially on deep inspiration. The nurse promptly returns her to bed and takes her temperature, finding it to be 100° F. the ward doctor is informed, makes a careful examination of the chest, but finds nothing definite. The patient is reassured and forgotten. On the following morning, in making his rounds, the doctor is informed that the patient still complains of pain in her side and that her temperature is 102° F. He goes over her chest promptly, finds a friction rub, with a few rales below the angle of the scapula and makes a diagnosis of dry pleurisy. A day or two later the patient may develop hemoptysis or phlebitis of the leg. She usually makes a prompt recovery and in ten days the little pulmonary upset is a thing of the past and forgotten. As a result of their extensive study on this subject, Hampton and Wharton conclude that postoperative venous phlebitis and thrombosis are not peculiar to any particular type of gynecological operations. There are a number of conditions that favor thrombus formation, but they believe that infection and trauma play the most important part. Phlebitis and thrombosis of the leg veins, when associated with pain

and swelling are rarely ever followed by fatal embolism. The important point brought out by this study is that postoperative pulmonary infarction in the majority of cases has heretofore been unrecognized chiefly because too much importance has been attached to negative physical findings and too little reliance placed upon a careful history.

PATHOLOGY AND BACTERIOLOGY

UNDER THE CHARGE OF

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The Relation of Pregnancy and Reproduction to Tumor Growth.—While somewhat diverse views have been expressed concerning the influences exerted by pregnancy on tumor growth, the consensus of opinion seems to be that during pregnancy the proliferation of the new-growth is retarded. Obviously experimental animals in which spontaneous tumors develop offer the most favorable opportunity for the exact analysis of the subject. SLYE (*Jour. Cancer Res.*, 1920, v, 25) studied the rate of growth of an alveolar tubular carcinoma of the mammary gland in sixty female mice during their reproductive and non-reproductive periods. All of the animals had previously born young. In thirty of these after the tumor appeared no young were again born and tumor growth in these was compared with that of the remaining thirty, in which young were constantly born after the appearance of tumor. The results tabulated demonstrate in a very striking manner the influence of pregnancy in modifying the rate of growth in the coexistent tumor. The amount of tumor grown by the non-reproducing animals was much greater than that grown by the reproducing animals, the daily rate in the former being much in excess of that in the latter. Tumorous mice which are not bred live from four to six weeks after the appearance of the tumor, which proliferates with great rapidity, while the reproductive animals live from eight months to a year, during which time the tumor becomes almost quiescent. The number of the young borne appears to be a factor in retarding the rate of growth. When the mice cease reproducing the tumors commence to grow again with renewed rapidity and the female only survives six to eight weeks after the birth of the last litter. It was also observed that multiple tumors were more frequent in non-reproducing than in reproducing animals.

The Relation of Inbreeding to Tumor Production.—Since inbreeding does not characterize the human race, any exact and comprehensive data concerning the relation of inbreeding to the incidence and inheritability of tumors must necessarily be derived from experimental animals. Slys has previously demonstrated that cancer inheritance in mice follows Mendelian ratios. These results were obtained by selected

mating. Similarly it is only by selected inbreeding that any increase in the numbers of tumors in a strain can be produced. Thus, SLYE (*Jour. Cancer Res.*, 1920, v, 53), by selected inbreeding (mating brother and sister of a hybrid strain carrying a definite percentage of cancer) in three branches obtained new strains with widely varying cancer incidence. One branch gave a tumor-free line, a second yielded a heterozygous line (*i. e.*, mice not themselves developing cancer but carrying it potentially) while the third was an extracted tumorous line. Since the progenitors of each line were brothers and sisters, and they were bred in the same manner, inbreeding, *per se*, was obviously not a factor in occasioning an increase in cancer. "What is put into a mating, and not the manner of putting it in, determines what characters shall appear in the offspring." It was shown that inbreeding, by lowering the vitality and diminishing the fertility of a strain, could eliminate cancer by racial extermination. It is important, in the analysis of results on the incidence of cancer, either spontaneous or inoculated, to bear in mind that the lowering of the vitality of a strain through inbreeding as well as by the hybridizing of stock which gives rise to inferior and infertile strains tends to decrease the percentage of cancer within the strain. The author maintains that "in the demonstration of the inheritability of cancer and other tumor types in mice their inheritability for man and every other species in which they occur has also been demonstrated." Further, since cancer and non-cancer tendencies segregate out and are transmitted as such in hybrid crosses, cancer being a recessive, can be eliminated from the human race, where the matings are hybridizations, by selected mating.

Varieties of Streptococci with Special Reference to Constancy.—CLAWSON (*Jour. Infect. Dis.*, 1920, xxvi, 93) in a study of strains of streptococci isolated from various sources, paid particular attention to the constancy of the special characteristics, such as peculiarities of morphology, action on the blood-agar plate, fermentation of various carbohydrates, agglutination and complement-fixation reactions, in an attempt to discover whether the various classes adopted by previous workers have sufficient relationship to source, habits, pathogenesis or other particular characteristic to justify such grouping. From the author's investigations there seems to be no direct relationship between the length of chains and pathogenesis in streptococci. Capsules were found less commonly among hemolyzers than among non-hemolyzers. Of the 134 strains, hemolysis was constant after nearly two years of artificial cultivation, only 4 regularly failed to ferment lactose, only 2 always fermented mannit and only 3 always failed to ferment salicin. Evidence pointed to the fact that all non-hemolytic strains were methemoglobin producers when grown on suitable mediums, and of 150 non-hemolytic strains investigated, only 5 always failed to ferment lactose, 36 always fermented mannit and 75 always fermented salicin, there seeming to be more uniformity of fermentation among hemolytic than non-hemolytic streptococci. The regular type of fermentation placed most of the non-hemolytics in the class of *S. mitis* and *S. salivarius* (Holman). Considering the lack of relationship between fermentation reactions and source or pathogenesis, and the wide distribution of organisms falling into non-hemolytic groups, the author believes it is

doubtful whether any of the smaller groups of non-hemolytic streptococci deserve a place in classification. He also prefers the term *S. hemolyticus* to *S. pyogenes* and *S. viridans* to *S. buccalis* (Blake). It was further found that agglutination reaction between hemolytic organism and homologous serum showed a high degree of uniformity, while the reactions of hemolytic serum with non-hemolytic organisms, non-hemolytic serum with hemolytic organisms or non-hemolytic serum with non-hemolytic organisms, except the homologous strains, gave a low percentage of positive results. The reaction of hemolytic serum with hemolytic antigen yielded a higher percentage of complement-fixation than those of hemolytic serum with non-hemolytic antigen, or non-hemolytic serum with non-hemolytic antigen, or non-hemolytic serum with hemolytic antigen. From these observations it is concluded that the hemolytic group is a homogeneous group in which there is a relatively high degree of constancy and that the non-hemolytic group is heterogeneous or less homogeneous than the hemolytic group.

Observations on Paratyphoid Bacilli Recently Isolated from Animals.

—In a recent study of the tissues of several hundred swine which died of enteric diseases, SPRAY (*Jour. Infect. Dis.*, 1920, xxvi, 340) found the predominating bacterial flora to be members of the paratyphoid-enteritis group. The materials for study were obtained either from diarrheal swine by routine inoculations from heart blood, lung, liver and spleen, kidney and mesenteric glands, or from hog cholera virus by directly plating or inoculating the virus blood into rabbits. In the case of diarrheal swine the identity of all paratyphoid strains isolated from the various organs of the same carcass was not to be assumed, because in at least three instances, two or even three distinct strains were isolated from the same body. With few exceptions the strains were readily classified. Forty strains were studied in detail by the employment of arabinose, xylose, dulcitol, inositol, lead acetate agar, glucose serum water and agglutination and absorption tests; 23 of the forty strains were recovered from the tissues of diseased swine; 8 from hog cholera virus blood by plating and 9 from rabbits dying after inoculation with virus blood known to contain gas-producing bacteria. It was found that 34 of the 40 strains so studied were *B. suis* *pasteurii*, 2 were identical with human *B. paratyphosus* A, 2 with human *B. paratyphosus* B and 2 were intermediate between *B. suis* *pasteurii* and *B. paratyphosus* B. *B. enteritidis* was not encountered at any time. No true representative of the paratyphoid enteritis group was isolated from the feces nor from the lumen of the intestines. The author emphasizes this as he does the value of the selective cultural media mentioned above.

The Comparative Oxygen Avidity of Normal and Malignant Cells Measured by Their Reducing Powers of Methylene Blue.—An interesting comparison of the reducing power of normal tissue and that of tumors is made by DREW (*British Jour. Exper. Path.*, 1920, i, 115) by means of methylene blue. A measured quantity (0.3 to 0.5 c.c.) of minced tissue was placed in a tube to which was added a definite amount of 0.001 per cent. methylene blue in Locke's solution minus the glucose. In order to prevent reoxidation a layer of paraffin was poured over each tube, which was then incubated at 37° C. During incubation the methylene blue became reduced to methylene white